FIG. 1

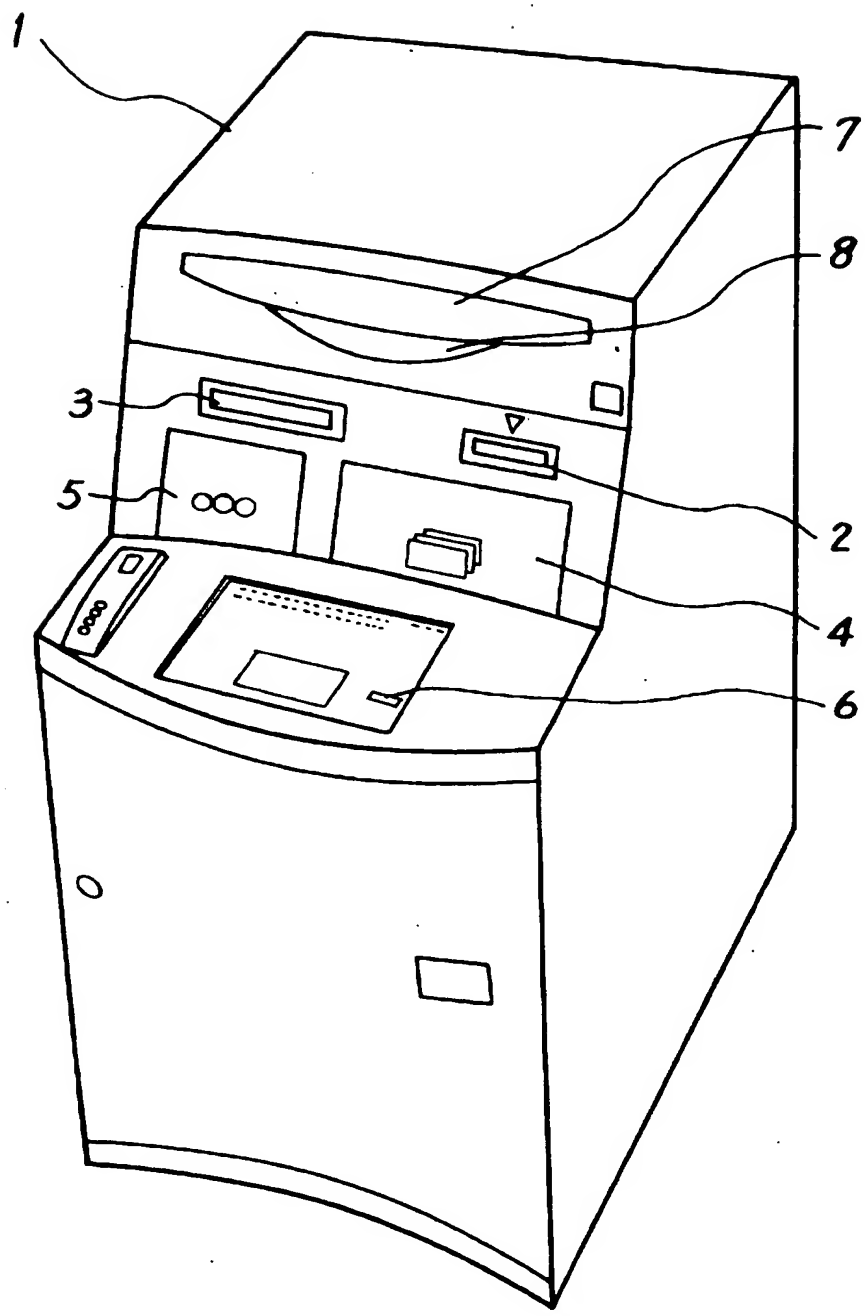


FIG. 2

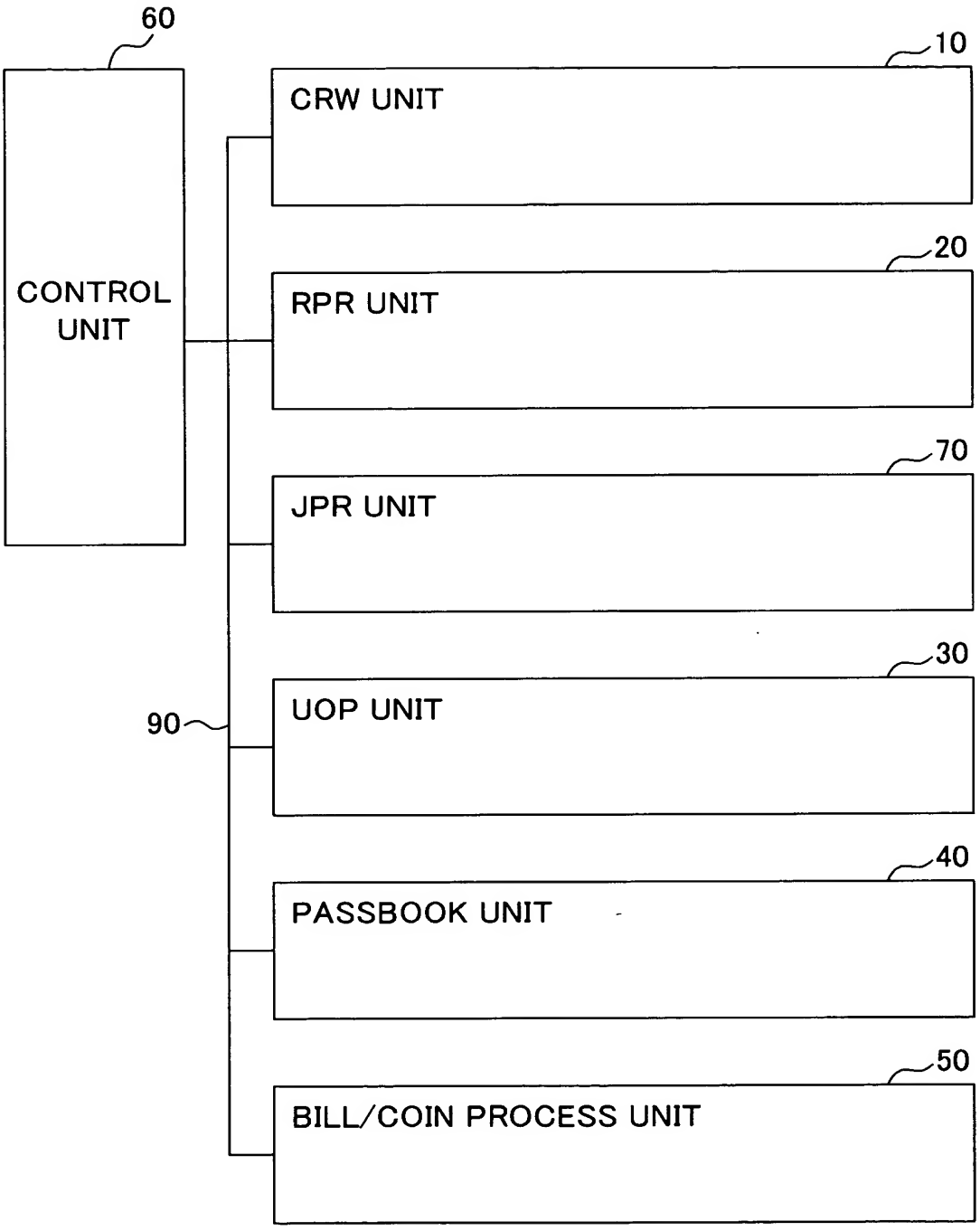

60
CONTROL UNIT
10
CRW UNIT
20
RPR UNIT
70
JPR UNIT
90
30
UOP UNIT
40
PASSBOOK UNIT
50
BILL/COIN PROCESS UNIT

FIG. 3

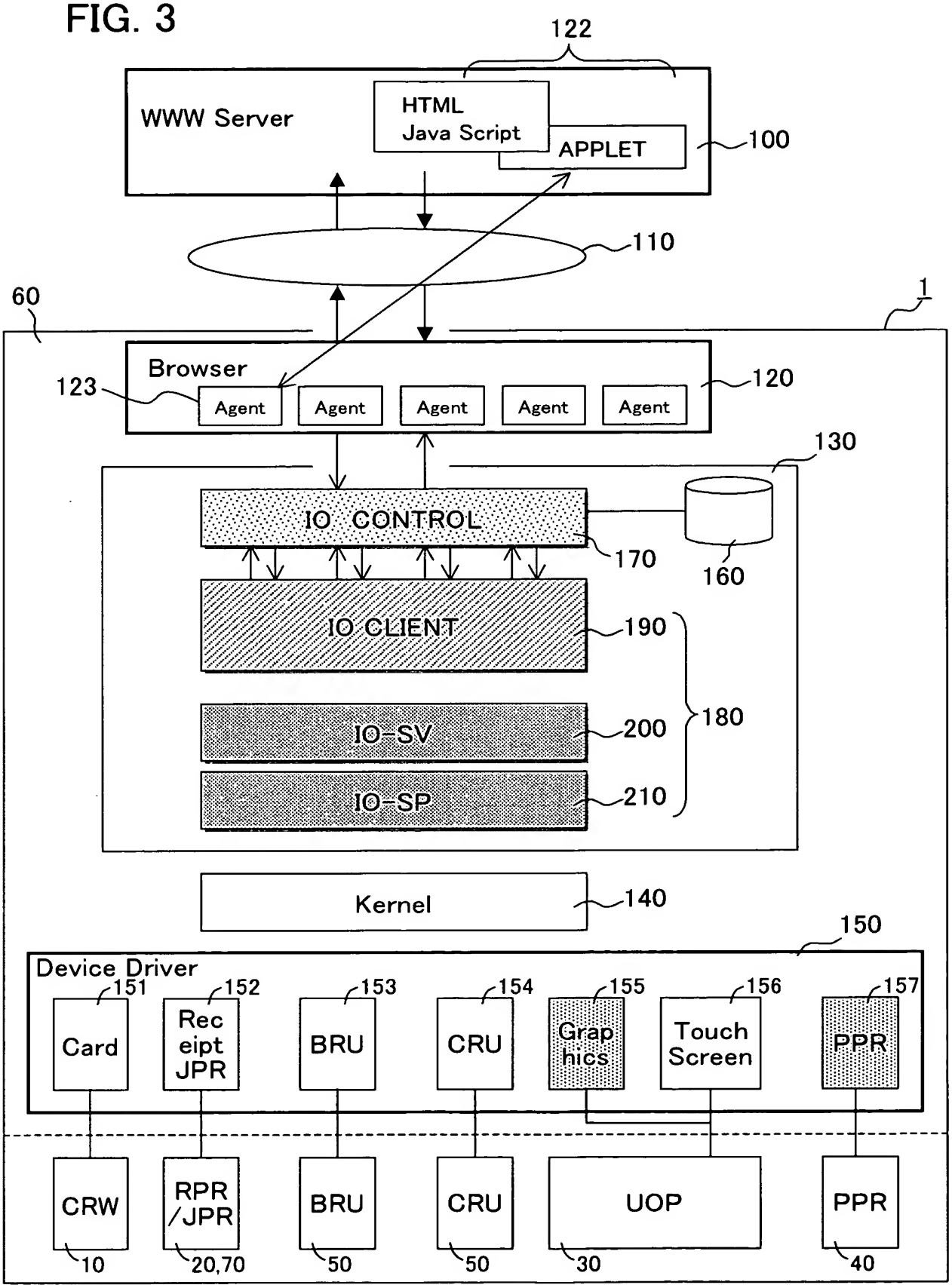

122
WWW Server
HTML
Java Script
APPLET
100
110
60
1
Browser
123
Agent
Agent
Agent
Agent
Agent
120
130
IO CONTROL
170
160
IO CLIENT
190
180
IO-SV
200
IO-SP
210
Kernel
140
150
Device Driver
151
152
153
154
155
156
157
Card
Rec
eipt
JPR
BRU
CRU
Grap
hics
Touch
Screen
PPR
CRW
RPR
/JPR
BRU
CRU
UOP
PPR
10
20,70
50
50
30
40

FIG. 4

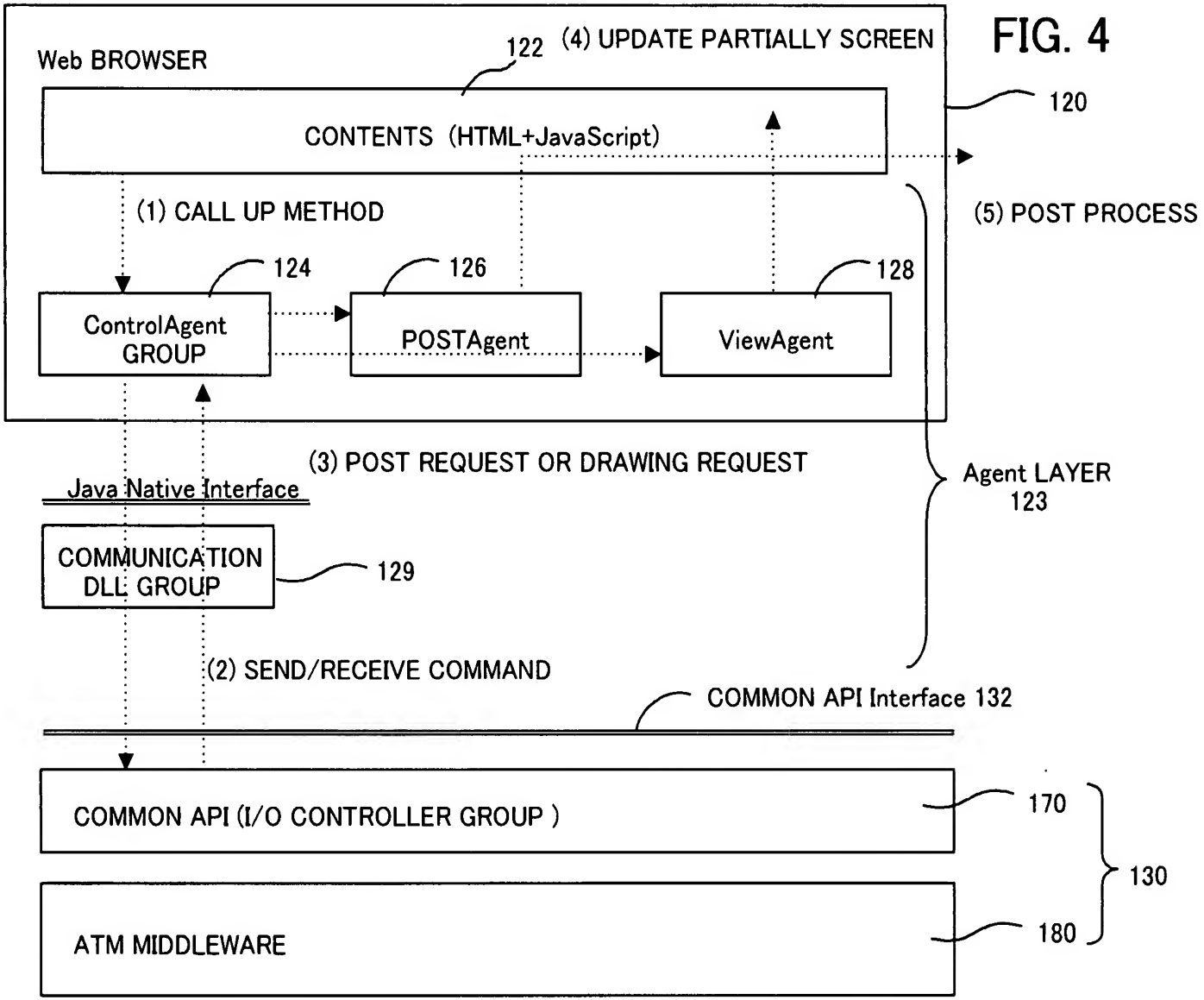

Web BROWSER
122
(4) UPDATE PARTIALLY SCREEN
120
CONTENTS (HTML+JavaScript)
(1) CALL UP METHOD
(5) POST PROCESS
124
126
128
ControlAgent GROUP
POSTAgent
ViewAgent
(3) POST REQUEST OR DRAWING REQUEST
Agent LAYER 123
Java Native Interface
COMMUNICATION DLL GROUP
129
(2) SEND/RECEIVE COMMAND
COMMON API Interface 132
COMMON API (I/O CONTROLLER GROUP)
170
130
ATM MIDDLEWARE
180

FIG. 5

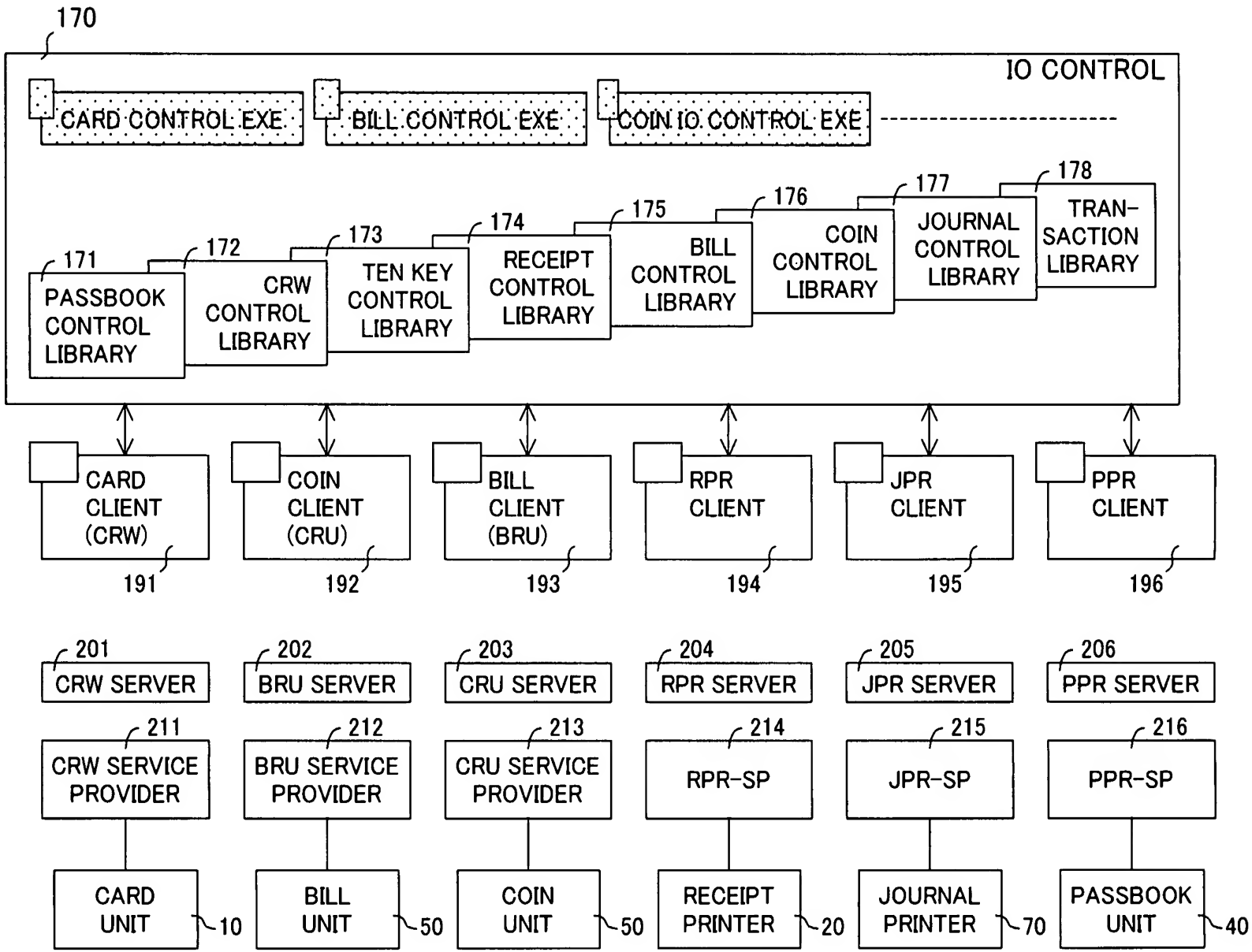

170
IO CONTROL
CARD CONTROL EXE
BILL CONTROL EXE
COIN IO CONTROL EXE
171
PASSBOOK CONTROL LIBRARY
172
CRW CONTROL LIBRARY
173
TEN KEY CONTROL LIBRARY
174
RECEIPT CONTROL LIBRARY
175
BILL CONTROL LIBRARY
176
COIN CONTROL LIBRARY
177
JOURNAL CONTROL LIBRARY
178
TRAN-SACTION LIBRARY
CARD CLIENT (CRW)
191
COIN CLIENT (CRU)
192
BILL CLIENT (BRU)
193
RPR CLIENT
194
JPR CLIENT
195
PPR CLIENT
196
201
CRW SERVER
202
BRU SERVER
203
CRU SERVER
204
RPR SERVER
205
JPR SERVER
206
PPR SERVER
211
CRW SERVICE PROVIDER
212
BRU SERVICE PROVIDER
213
CRU SERVICE PROVIDER
214
RPR-SP
215
JPR-SP
216
PPR-SP
CARD UNIT
10
BILL UNIT
50
COIN UNIT
50
RECEIPT PRINTER
20
JOURNAL PRINTER
70
PASSBOOK UNIT
40

FIG. 6

COMMAND TYPE	COMMAND
CRW COMMAND	CARD INSERTION
	CARD EJECT
RPR COMMAND	PRINT
	RELEASE
PPR COMMAND	PASSBOOK INSERTION
	PRINT
	MS WRITE
	PASSBOOK EJECT
	AUTO TURN PAGE
BRU COMMAND (CRU COMMAND)	INITIALIZATION
	ACCEPTANCE/COUNTING
	STORE
	DEPOSIT RETURN
	FEED
	RELEASE
	CAPTURE
	TRANSPORT PATH CHECK
	JAM RESET

FIG. 7

AGENT	METHOD	IO CONTROLLER								
		NONE	BILL	COIN	PAS BOOK	CARD	RECEIPT	JOURNAL	TRANS-ACTION	TEN KEY
SYNCHRONIZATION	INITIALIZE		●	●	●	●	●	●	●	●
SYNCHRONIZATION	MECHANISM RESET		●	●	●	●	●	●		
SYNCHRONIZATION	BILL/COIN INSERT		●	●						
SYNCHRONIZATION	MEDIUM SIMULTANEOUS EJECT		●	●	●	●	●			
SYNCHRONIZATION	PRINT/FEED/MS WRITE/EJECT PREPARE		●	●	●	●	●	●		
SYNCHRONIZATION	DEPOSIT RETURN		●	●						
SYNCHRONIZATION	STORAGE		●	●						
SYNCHRONIZATION	FORCE-EJECT/CAPTURE		●	●	●	●	●			
SYNCHRONIZATION	OBTAIN UNIT INFORMATION/SET TRANSACTION STATUS/TWO-SCREEN DISPLAY		●	●	●	●	●	●	●	●
SYNCHRONIZATION	CANCEL									
SYNCHRONIZATION										
SYNCHRONIZATION	DEPOSIT/WITHDRAWAL PREPARE		●	●						
SYNCHRONIZATION	FORCE REPLENISH		●	●						
SYNCHRONIZATION	JAM RESET		●	●						
SYNCHRONIZATION	CARD/PASSBOOK INSERT				●	●				
POST	POST PROCESS	●								
	POST DATA HOLD	●								
TEXT DISPLAY	FONT SET	●								
	TEXT DISPLAY	●								
	TEXT ERASE	●								

FIG. 8

AGENT	METHOD	IO CONTROLLER								
		NONE	BILL	COIN	PAS BOOK	CARD	RECEIPT	JOURNAL	TRANS-ACTION	TEN KEY
BILL CONTROL	RECEIPT/COUNTING		●							
	STORAGE		●							
	DEPOSIT RETURN		●							
	RELEASE		●							
	CANCEL		●							
PASSBOOK CONTROL	PRINT LINE SET/PAGE MARK READ				●					
	MS READ				●					
	AUTO TURN PAGE				●					
	PAGE CHECK AUTO TURN				●					
	SET PASSBOOK TYPE INFORMATION				●					
CARD CONTROL	CARD INSERT					●				
	CANCEL					●				
	MONEY TRANSFER CARD PRINT					●				
	MONEY TRANSFER CARD ISSUE					●				
	EJECT PREPARE					●				
RECEIPT CONTROL	REGISTER OVERLAY						●			
	EJECT PREPARE						●			
TRANSACTION CONTROL	SET TRANSACTION INFORMATION								●	
	MONITOR DEVICE STATUS								●	
	OBTAIN DEVICE STATUS								●	
	SET OSPERATION INFORMATION								●	
	CANCEL								●	
TEN KEY	TEN KEY INPUT START									●
	TEN KEY INPUT END									●

```
<HTML>
<HEAD>
<TITLE>WebATM Sample</TITLE>
</HEAD>

<BODY>

// SPECIFY AGENT WHICH IS CALLED UP IN THE SCREEN
<APPLET CODE="U_agtSync_initial.class" codebase = "http://webatm:8080/webatm"
        WIDTH="0" HEIGHT="0" NAME="U_agtSync_initial" >
</APPLET>

// MAKE MAYSCRIPT DEFINITION SUCH THAT POSTAgent CALLS UP FUNCTION OF Java Script
<APPLET CODE="U_agtPost.class" codebase = "http://webatm:8080/webatm"
WIDTH="0" HEIGHT="0" NAME="U_agtPost" MAYSCRIPT>

<SCRIPT language="javascript">
<!--
                // DEFINE FUNCTION THAT IS CALLED UP FROM POSTAgent (REQUISITE)
                function postFunc(postData){ document.sys_form.ioResponse.value = postData;
                        window.document.sys_form.submit();
                }

                // CALL UP INITIAL METHOD IN SYNCHRONIZATION Agent
                ret = document.U_agtSync_.initial.initial (inputParam, parseInt(postMode), parseInt(maxTimer));
                if (ret < 0) {
                        // ABNORMAL NOTIFY PROCESS
                        ~OMIT~
                }
// -->
</SCRIPT>
</BODY>
</HTML>
```

FIG. 9

FIG. 10

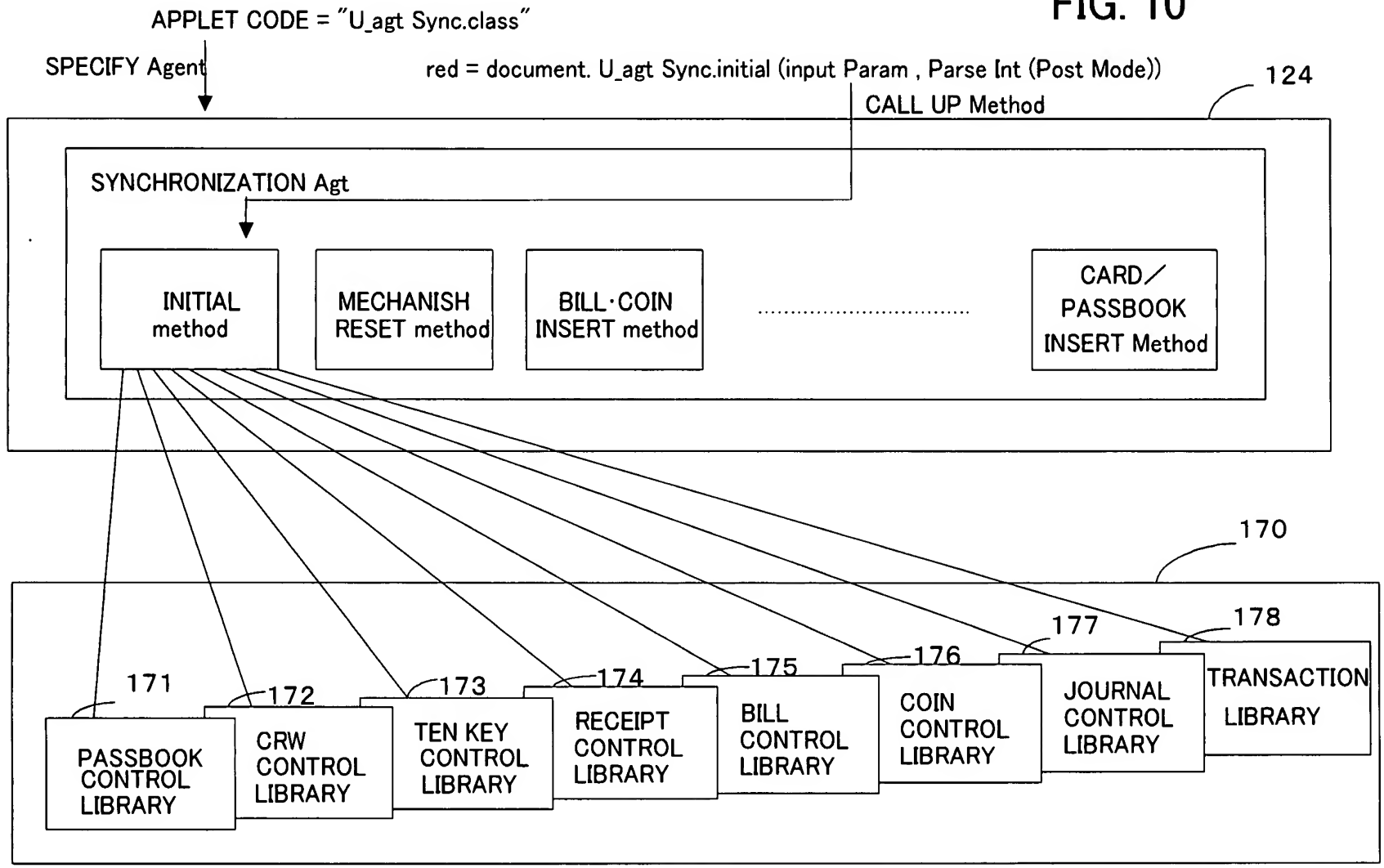
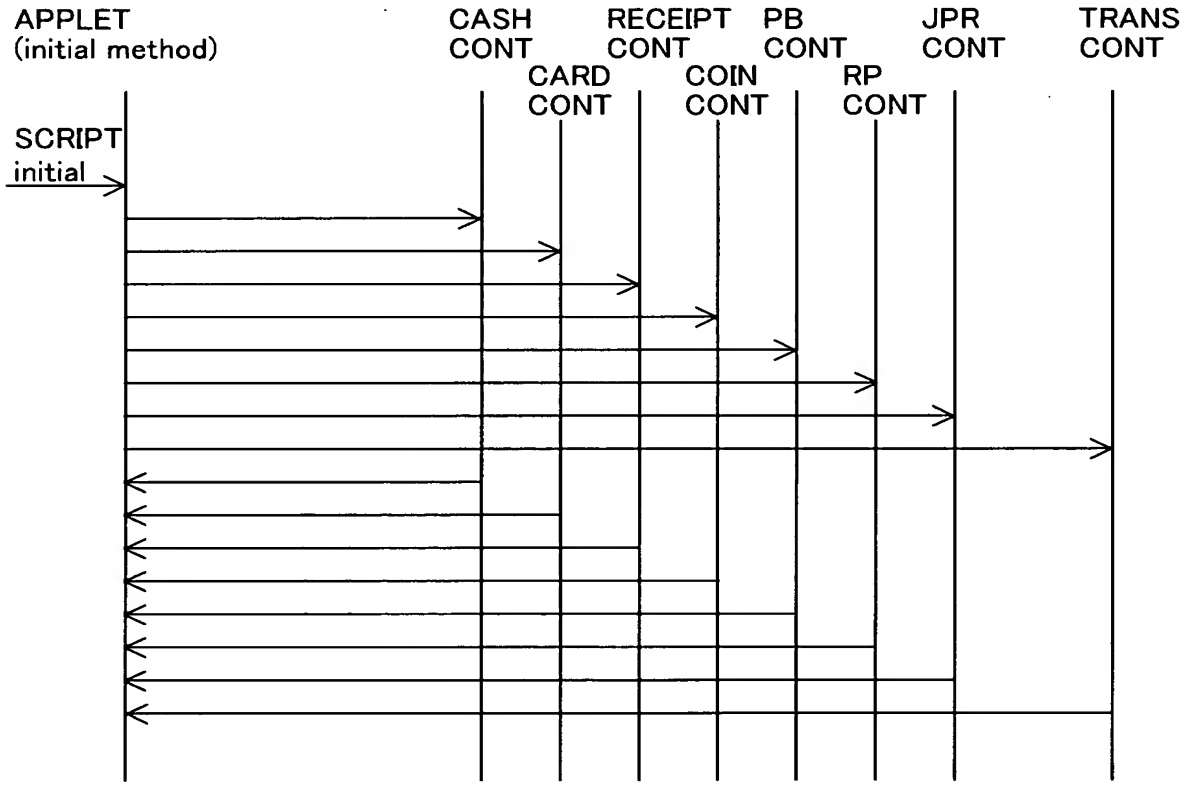

APPLET CODE = "U_agt Sync.class"
SPECIFY Agent
red = document. U_agt Sync.initial (input Param , Parse Int (Post Mode))
CALL UP Method
124
SYNCHRONIZATION Agt
INITIAL method
MECHANISH RESET method
BILL·COIN INSERT method
CARD/ PASSBOOK INSERT Method
170
171
172
173
174
175
176
177
178
PASSBOOK CONTROL LIBRARY
CRW CONTROL LIBRARY
TEN KEY CONTROL LIBRARY
RECEIPT CONTROL LIBRARY
BILL CONTROL LIBRARY
COIN CONTROL LIBRARY
JOURNAL CONTROL LIBRARY
TRANSACTION LIBRARY

FIG. 11

Input Param

1	1	1	1	1	1	1	1
BILL	COIN	PASSBOOK	CARD	RECEIPT	JOURNAL	TRANSACTION	TEN KEY

FIG. 12



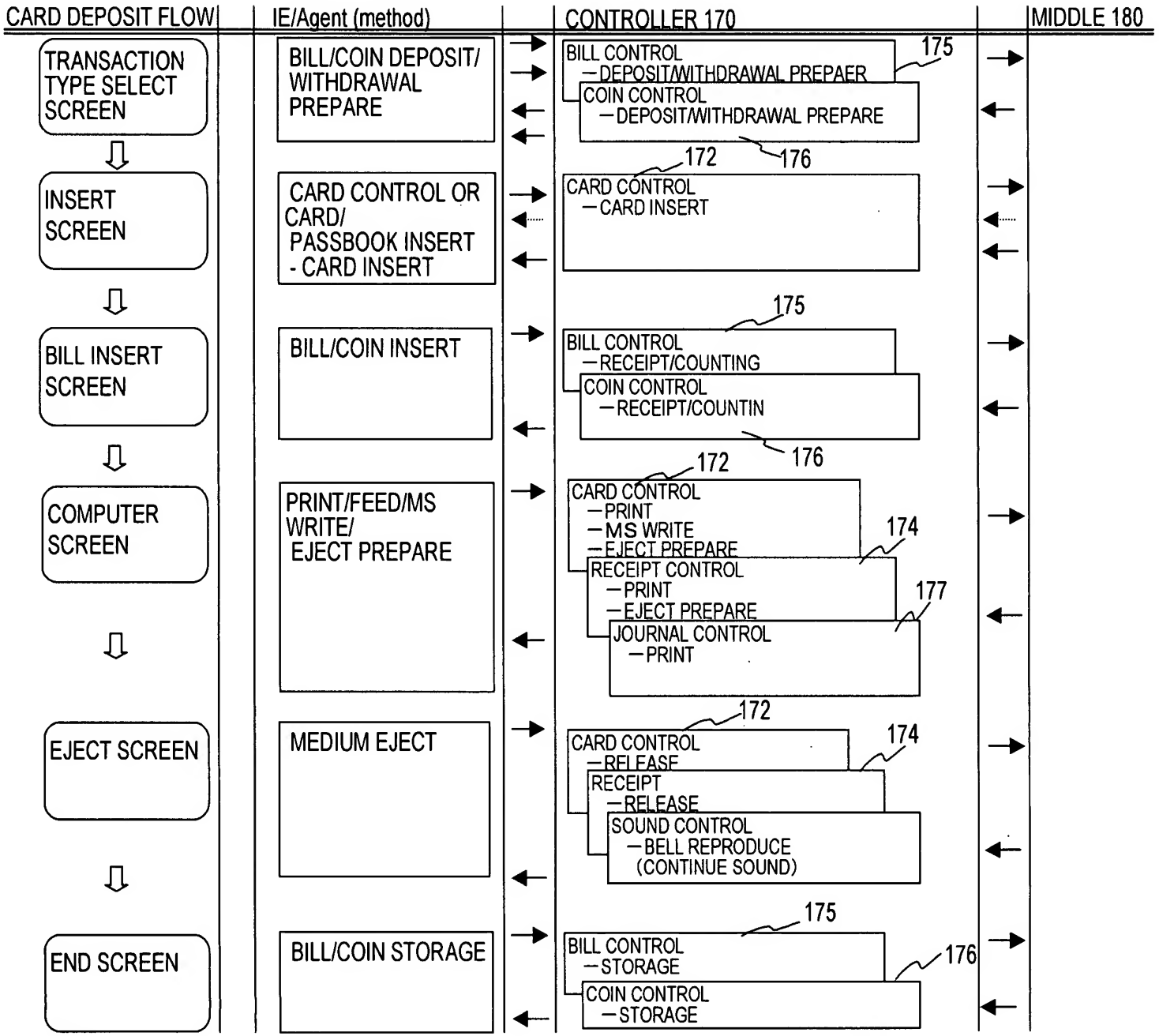

CARD DEPOSIT FLOW
IE/Agent (method)
CONTROLLER 170
MIDDLE 180
TRANSACTION TYPE SELECT SCREEN
BILL/COIN DEPOSIT/ WITHDRAWAL PREPARE
BILL CONTROL
—DEPOSIT/WITHDRAWAL PREPAER
175
COIN CONTROL
—DEPOSIT/WITHDRAWAL PREPARE
INSERT SCREEN
CARD CONTROL OR CARD/ PASSBOOK INSERT - CARD INSERT
172
176
CARD CONTROL
—CARD INSERT
BILL INSERT SCREEN
BILL/COIN INSERT
175
BILL CONTROL
—RECEIPT/COUNTING
COIN CONTROL
—RECEIPT/COUNTIN
176
COMPUTER SCREEN
PRINT/FEED/MS WRITE/ EJECT PREPARE
172
CARD CONTROL
—PRINT
—MS WRITE
—EJECT PREPARE
174
RECEIPT CONTROL
—PRINT
—EJECT PREPARE
177
JOURNAL CONTROL
—PRINT
EJECT SCREEN
MEDIUM EJECT
172
CARD CONTROL
—RELEASE
174
RECEIPT
—RELEASE
SOUND CONTROL
—BELL REPRODUCE
(CONTINUE SOUND)
END SCREEN
BILL/COIN STORAGE
175
BILL CONTROL
—STORAGE
176
COIN CONTROL
—STORAGE

FIG. 13

FIG. 14

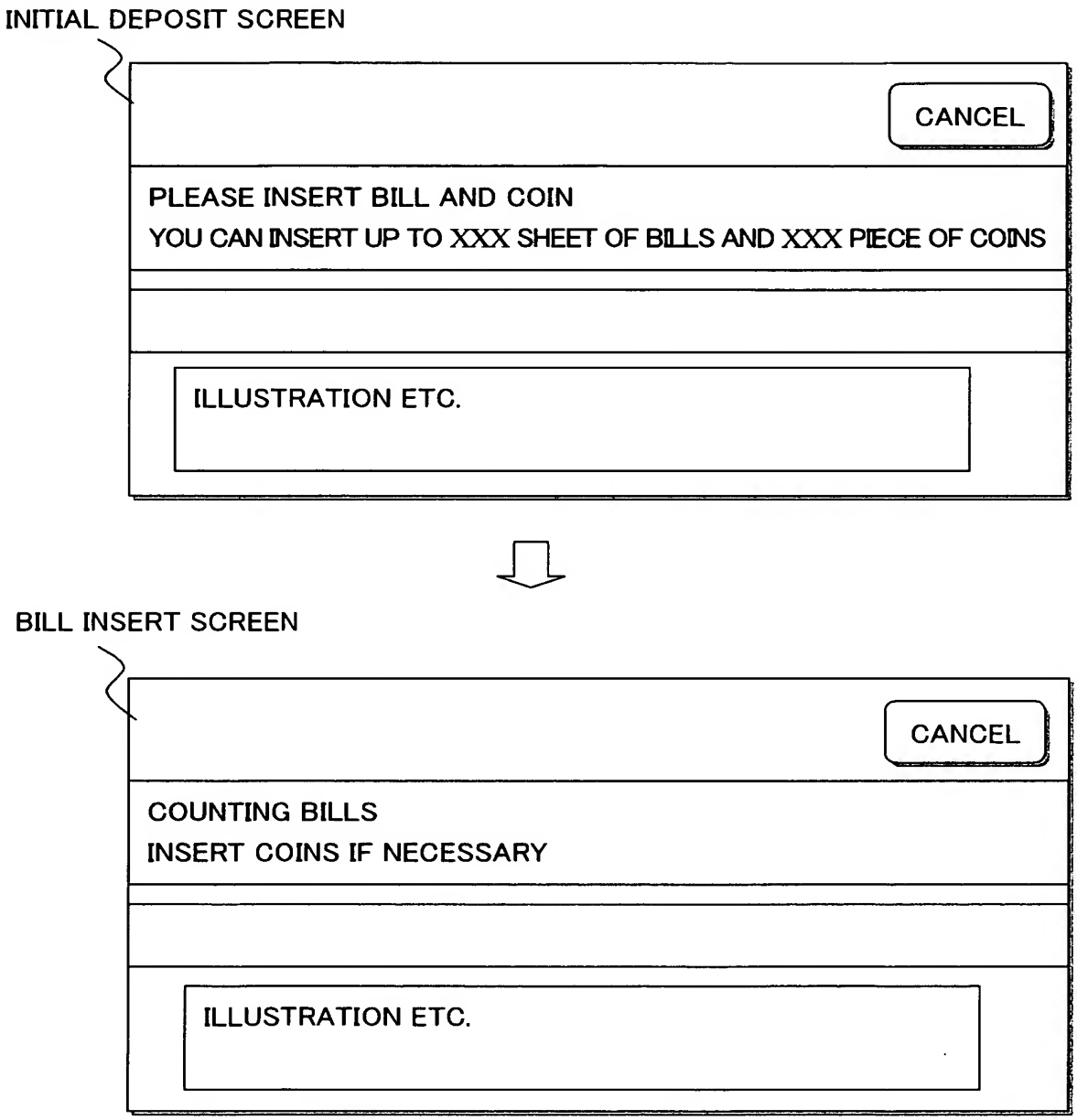

INITIAL DEPOSIT SCREEN
CANCEL
PLEASE INSERT BILL AND COIN
YOU CAN INSERT UP TO XXX SHEET OF BILLS AND XXX PIECE OF COINS
ILLUSTRATION ETC.
BILL INSERT SCREEN
CANCEL
COUNTING BILLS
INSERT COINS IF NECESSARY
ILLUSTRATION ETC.

FIG. 15

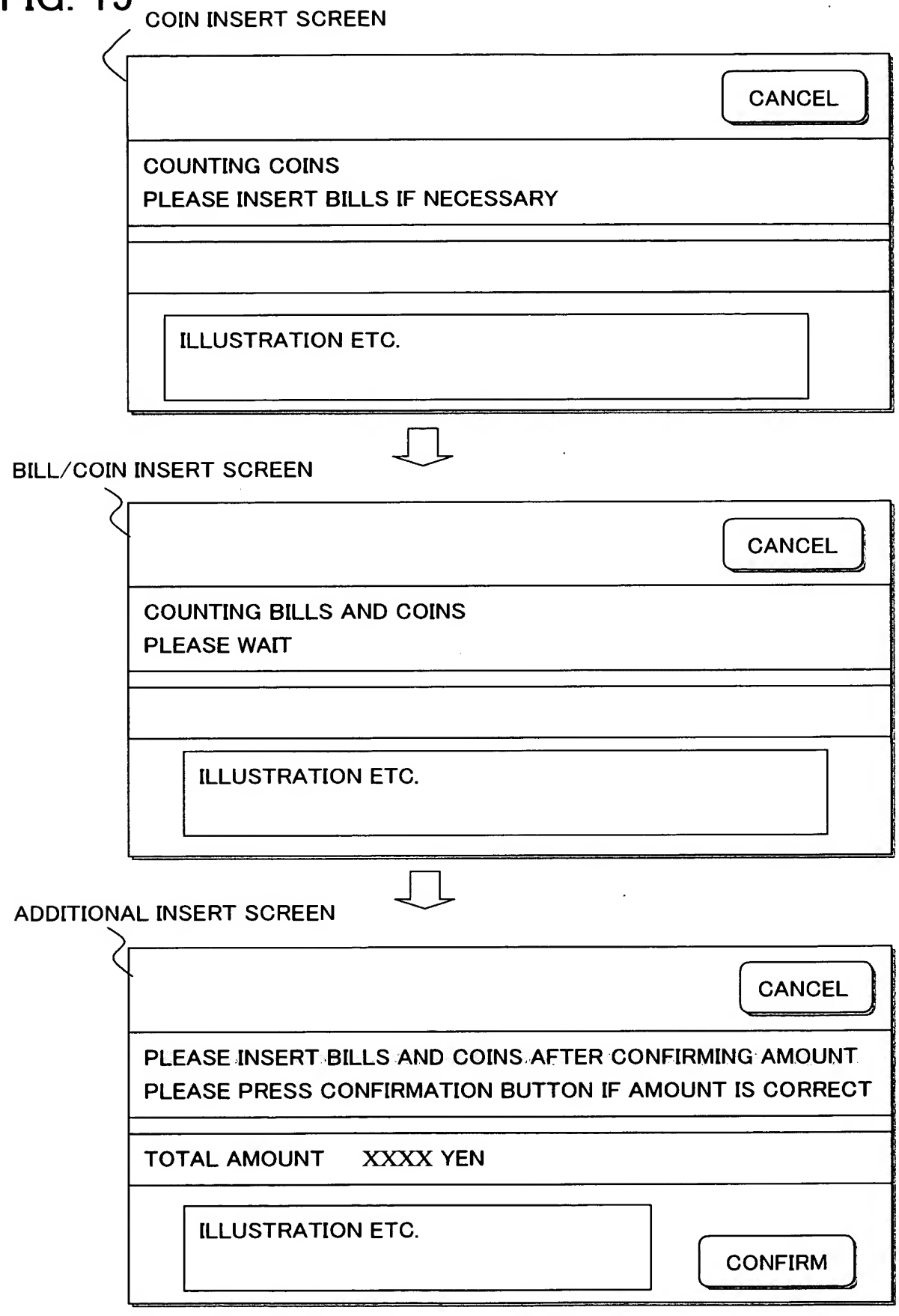

COIN INSERT SCREEN
CANCEL
COUNTING COINS
PLEASE INSERT BILLS IF NECESSARY
ILLUSTRATION ETC.
BILL/COIN INSERT SCREEN
CANCEL
COUNTING BILLS AND COINS
PLEASE WAIT
ILLUSTRATION ETC.
ADDITIONAL INSERT SCREEN
CANCEL
PLEASE INSERT BILLS AND COINS AFTER CONFIRMING AMOUNT
PLEASE PRESS CONFIRMATION BUTTON IF AMOUNT IS CORRECT
TOTAL AMOUNT XXXX YEN
ILLUSTRATION ETC.
CONFIRM

FIG. 16

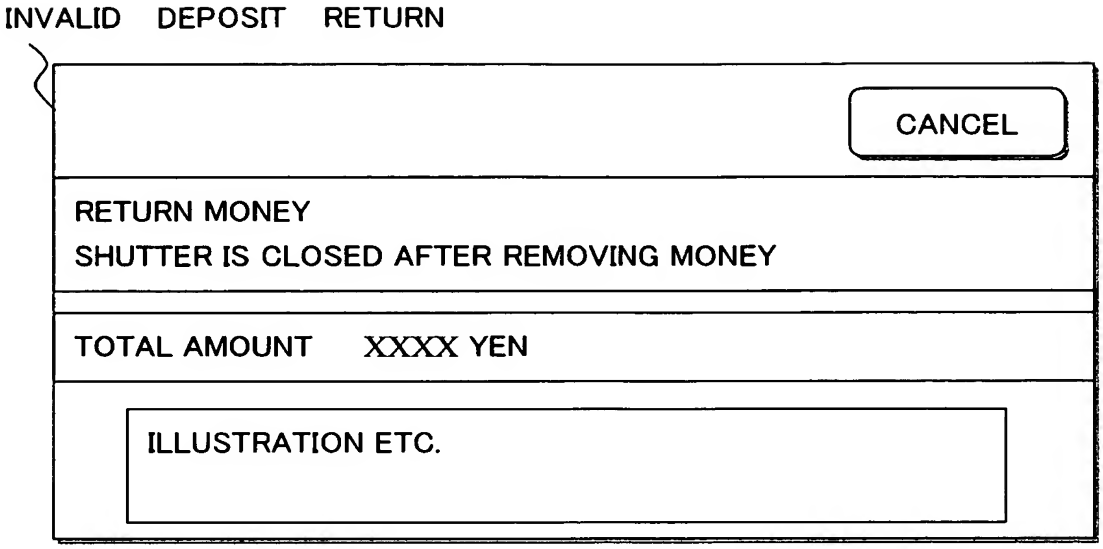

INVALID DEPOSIT RETURN
CANCEL
RETURN MONEY
SHUTTER IS CLOSED AFTER REMOVING MONEY
TOTAL AMOUNT XXXX YEN
ILLUSTRATION ETC.

FIG. 17

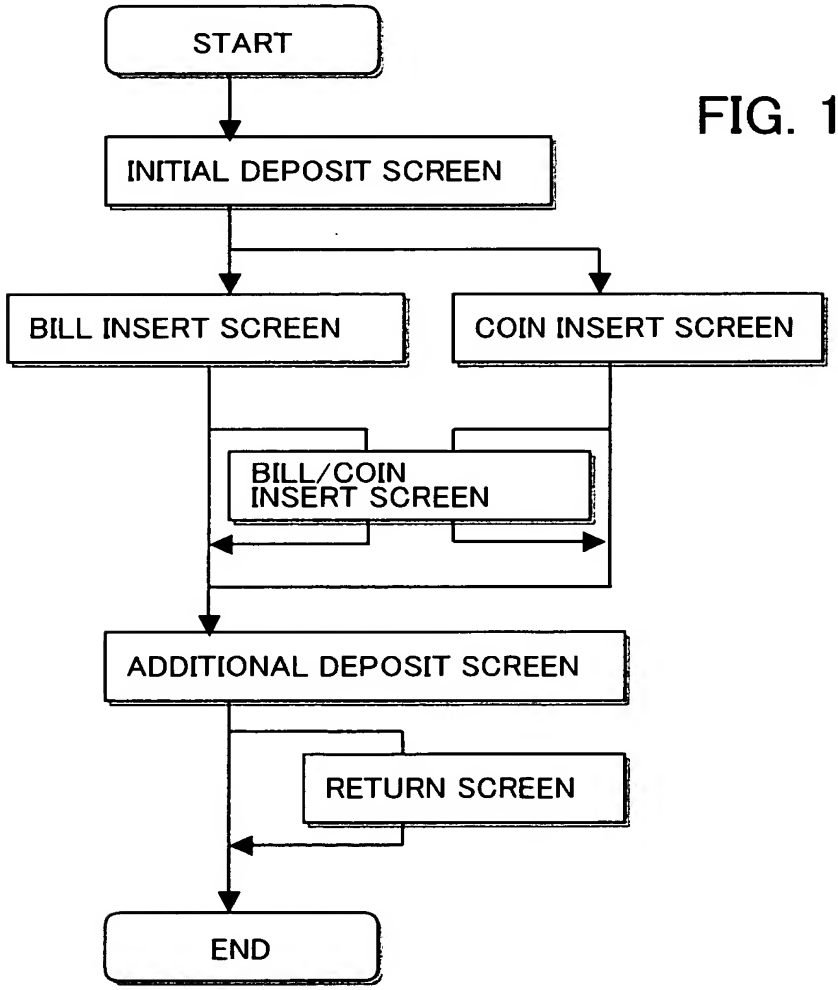
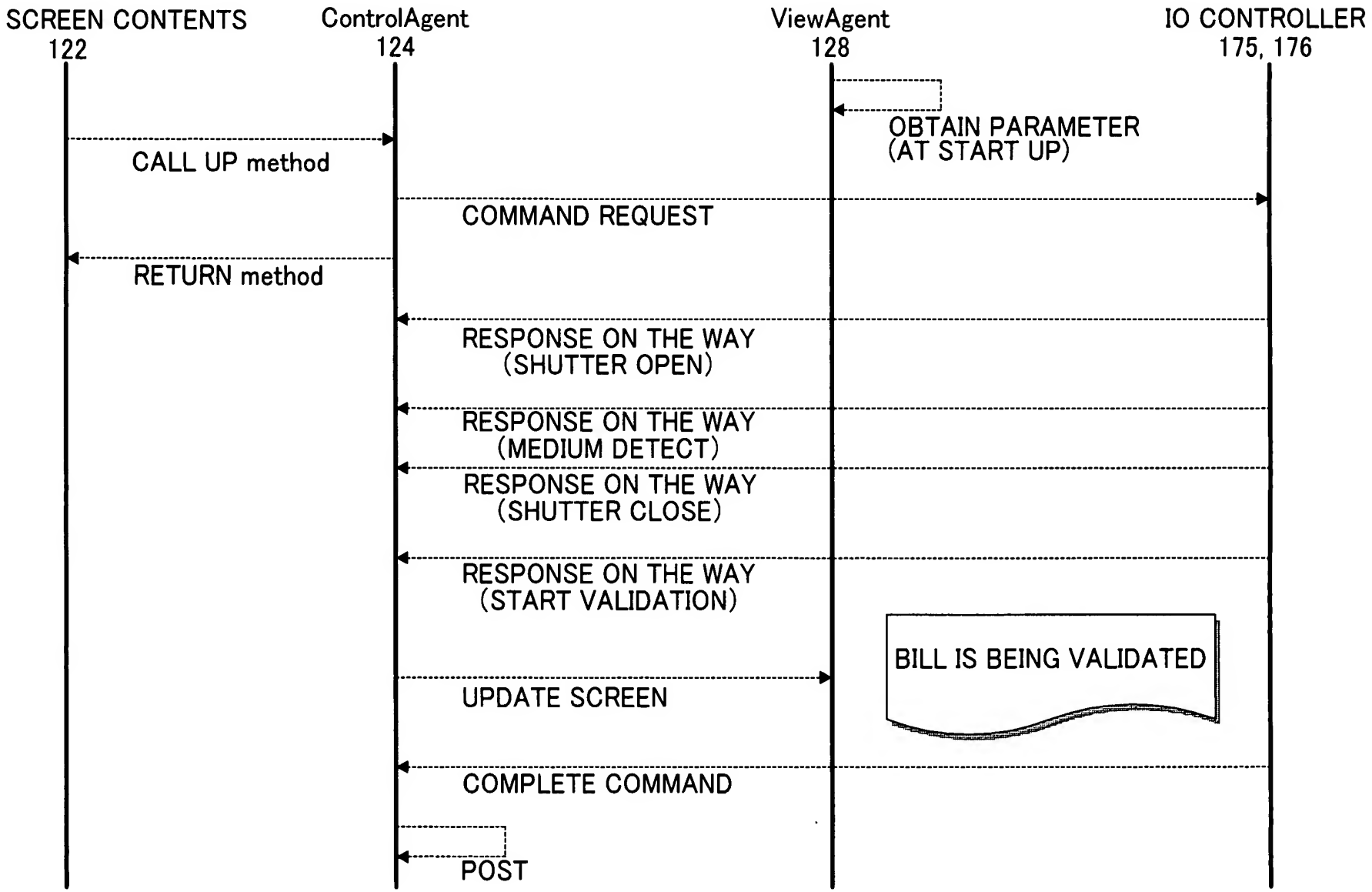

START
INITIAL DEPOSIT SCREEN
BILL INSERT SCREEN
COIN INSERT SCREEN
BILL/COIN INSERT SCREEN
ADDITIONAL DEPOSIT SCREEN
RETURN SCREEN
END

FIG. 18


SCREEN CONTENTS
122
ControlAgent
124
ViewAgent
128
IO CONTROLLER
175, 176
OBTAIN PARAMETER
(AT START UP)
CALL UP method
COMMAND REQUEST
RETURN method
RESPONSE ON THE WAY
(SHUTTER OPEN)
RESPONSE ON THE WAY
(MEDIUM DETECT)
RESPONSE ON THE WAY
(SHUTTER CLOSE)
RESPONSE ON THE WAY
(START VALIDATION)
BILL IS BEING VALIDATED
UPDATE SCREEN
COMPLETE COMMAND
POST

```
<HTML>
<HEAD>
<TITLE> Web ATM Sample</TITLE>
<META http-equiv="Content-Type" content="text/html; charset=shift_jis">
</HEAD>
<BODY background="http://webatm:8080/webatm/xxx.bmp">

// SPECIFY Agent which is called up in the screen
<APPLET CODE="U_agtSync_insertCash.insertCash" CODEBASE="http://webatm:8080/webatm"
        WIDTH=0 HEIGHT=0 NAME="U_agtSync_insertCash" MAYSCRIPT>
</applet>

// MAKE MAYSCRIPT definition such that POSTAgent calls up function of JavaScript
<APPLET CODE="U_agtPost" CODEBASE = "http//webatm:8080/webatm"
        WIDTH=0 HEIGHT=0 NAME="U_agtPost" MAYSCRIPT>
</applet>

// SPECIFY View Agent
<APPLET CODE="U_agtView" CODEBASE="http://webatm:8080/webatm"
        WIDTH=100 HEIGHT=100 ALIGN=LEFT HSAPCE=10 VSPACE=10 NAME="U_agtView">
<PARAM NAME=fontKind    Value="Serif'>
<PARAM NAME=fontPoint   Value="14">
<PARAM NAME=fontStyle   Value="Bold">
<PARAM NAME=fontColor   Value="Red">
<PARAM NAME=fontColor   Value="Red">
<PARAM NAME=background  Value="black">
<PARAM NAME=startX      Value="10">
<PARAM NAME=startY      Value="10">
<PARAM NAME=endX        Value="100">
<PARAM NAME=endY        Value="80">
<PARAM NAME=text        Value="BILL IS BEING VALIDATED">
</applet>

<SCRIPT language="javascript">
<! - -
      // DEFINE FUNCTION which is called up from POSTAgent (requisite)
      function postFunc(postData){
           document.sys_form.ioResponse.value = postData;
           window.document.sys_form.submit();
      }
// -->
</SCRIPT>
<FORM name="sys_form" method="post" action="http://webatm:8080/webatm/main.jsp">
      ~OMIT~
      <font size=10>PLEASE INSERT BILL/COIN </font>
       <BR>
       <HR>
</FORM
<SCRIPT language="javascript">
<! - -
       //CALL UP ControlAgent
       ret = document.U_agtSync_insertCash.insertCash(insertCashMode,inputParam,postMode,maxTimer);
       if(ret < 0) {
        //ABNORMAL NOTIFY PROCESS
       ~OMIT~
       }
// -->
</SCRIPT>
</BODY>
</HTML>
```

PARAMETER definition of ViewAgent

FIG. 19

FIG. 20

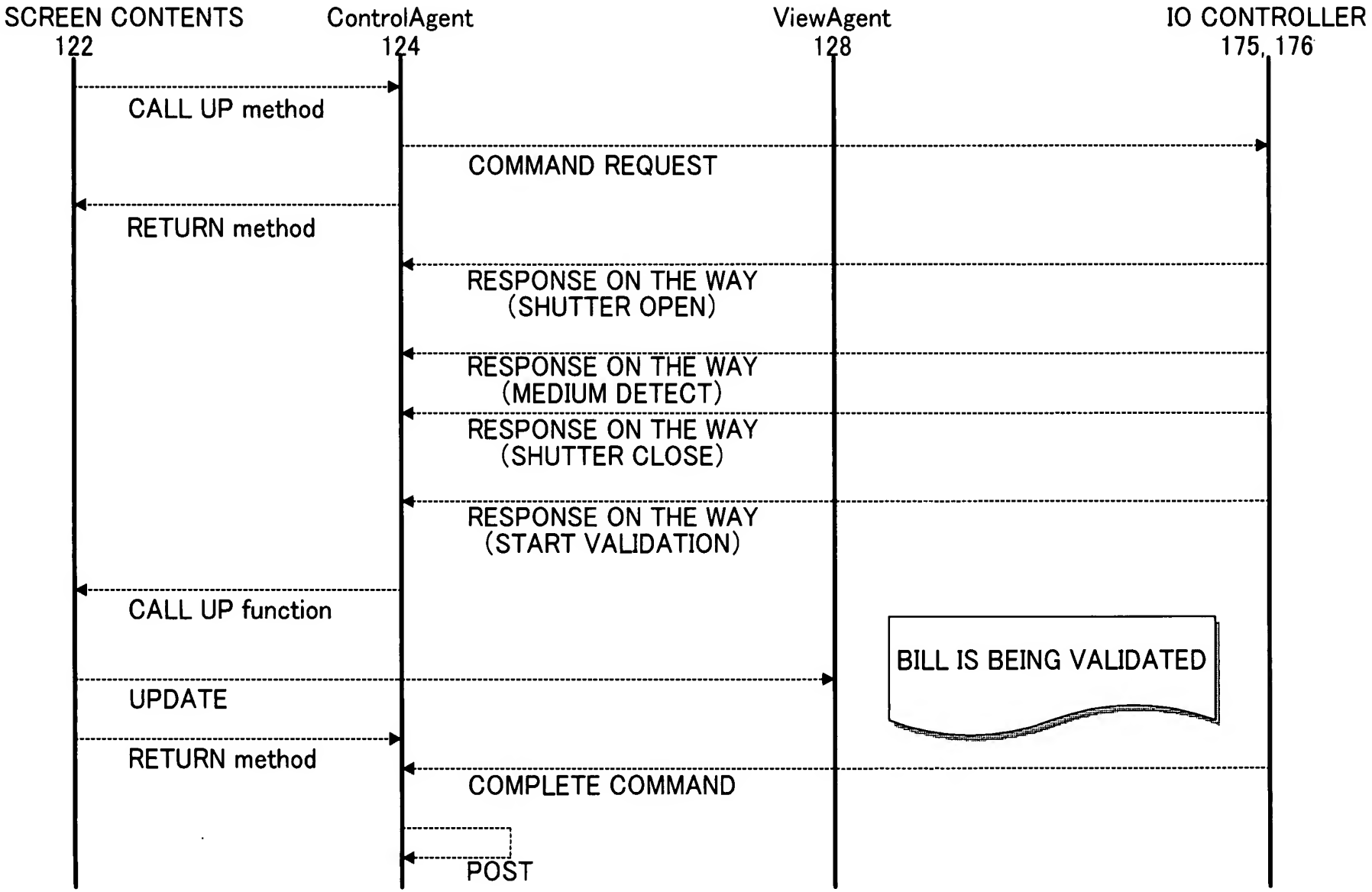

SCREEN CONTENTS
122
ControlAgent
124
ViewAgent
128
IO CONTROLLER
175, 176
CALL UP method
COMMAND REQUEST
RETURN method
RESPONSE ON THE WAY
(SHUTTER OPEN)
RESPONSE ON THE WAY
(MEDIUM DETECT)
RESPONSE ON THE WAY
(SHUTTER CLOSE)
RESPONSE ON THE WAY
(START VALIDATION)
CALL UP function
BILL IS BEING VALIDATED
UPDATE
RETURN method
COMPLETE COMMAND
POST

FIG. 21

```
<HTML>
<HEAD>
<META http-equiv="Content-Type" content="text/html; charset=shift_jis">
<TITLE>WebATM sample</TITLE>
</HEAD>
<BODY background="http://webatm:8080/webatm/xxx.bmp">

// SPECIFY Agent which is called up in the screen
<applet code="U_agtSync_insertCash.insertCash" codebase="http://webatm:8080/webatm"
        width=0 height=0 name="U_agtPost" MAYSCRIPT>
</applet>

// MAKE MAYSCRIPT definition such that POSTAgent calls up function of JavaScript
<applet code="U_agtPost" codebase = "http://webatm:8080/webatm"
        width=- height=p name="U_agtPost" MAYSCRIPT>
</applet>

// SPECIFY View Agent
<applet code="U_agtView" codebase="http://webatm:8080/webatm"
        width=100 height=100 align=left hspace=10 vspace=10 name="U_agtView">
</applet>

<SCRIPT language="javascript">
<! - -
      // DEFINE FUNCTION which is called up from POSTAgent (requisite)
      function postFunc (postData){
           document.sys_form.ioResponse.value = postData;
           window.document.sys_form.submit();
      }

      //DEFINE FUNCTION which is called up from ControlAgent (requisite)
      function insertCashFunc(eventKind, billVal, coinVal){
           switch (eventKind){
                case 1:   //START VALIDATION (BILL)
                     // CALL UP ViewAgent
                     ret =document.U_agtView.setFont (fontKind, fontPoint, fontStyle, fontColor, background);
                     ret =document.U_agtView.showText (startX, startY, endX, endY, text);
                     break;
                case 2:   //START VALIDATION (COIN)
                      ~OMIT~
                case n:   //END VALIDATION (BILL/COIN)
                      ~OMIT~
      }
    }
// -->
</SCRIPT>
<FORM name="sys_form" method="post" action="http://webatm:8080/webatm/main.jsp">
       ~OMIT~
       <font size=10>PLEASE INSERT BILL/COIN </font>
        <BR>
        <HR>
</FORM
<SCRIPT language="javascript">
<! - -
        //CALL UP ControlAgent
        ret = document.U_agtSync_insertCash.insertCash (insertCashMode, inputParam, postMode, maxTimer);
        if(ret < 0) {
         //ABNORMAL NOTIFY PROCESS
       ~OMIT~
        }
// -->
</SCRIPT>
</BODY>
</HTML>
```

FIG. 22

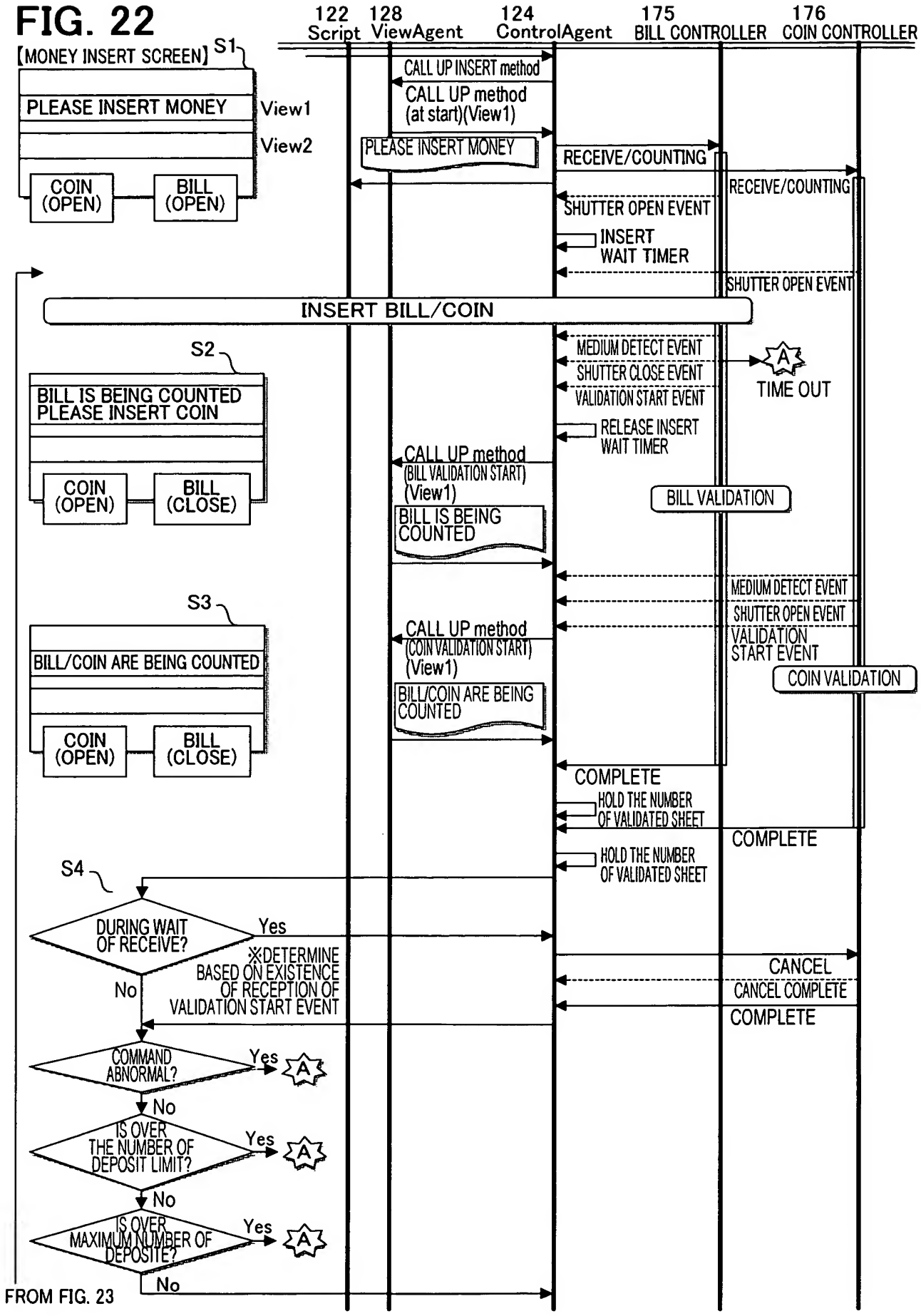

122 Script
128 ViewAgent
124 ControlAgent
175 BILL CONTROLLER
176 COIN CONTROLLER
【MONEY INSERT SCREEN】
S1
PLEASE INSERT MONEY
View1
View2
COIN (OPEN)
BILL (OPEN)
CALL UP INSERT method
CALL UP method (at start)(View1)
PLEASE INSERT MONEY
RECEIVE/COUNTING
RECEIVE/COUNTING
SHUTTER OPEN EVENT
INSERT WAIT TIMER
SHUTTER OPEN EVENT
INSERT BILL/COIN
MEDIUM DETECT EVENT
SHUTTER CLOSE EVENT
VALIDATION START EVENT
A
TIME OUT
S2
BILL IS BEING COUNTED
PLEASE INSERT COIN
COIN (OPEN)
BILL (CLOSE)
RELEASE INSERT WAIT TIMER
CALL UP method (BILL VALIDATION START) (View1)
BILL IS BEING COUNTED
BILL VALIDATION
MEDIUM DETECT EVENT
SHUTTER OPEN EVENT
VALIDATION START EVENT
S3
BILL/COIN ARE BEING COUNTED
COIN (OPEN)
BILL (CLOSE)
CALL UP method (COIN VALIDATION START) (View1)
BILL/COIN ARE BEING COUNTED
COIN VALIDATION
COMPLETE
HOLD THE NUMBER OF VALIDATED SHEET
COMPLETE
HOLD THE NUMBER OF VALIDATED SHEET
S4
DURING WAIT OF RECEIVE?
Yes
※DETERMINE BASED ON EXISTENCE OF RECEPTION OF VALIDATION START EVENT
No
CANCEL
CANCEL COMPLETE
COMPLETE
COMMAND ABNORMAL?
Yes
A
No
IS OVER THE NUMBER OF DEPOSIT LIMIT?
Yes
A
No
IS OVER MAXIMUM NUMBER OF DEPOSITE?
Yes
A
No
FROM FIG. 23

FIG. 23

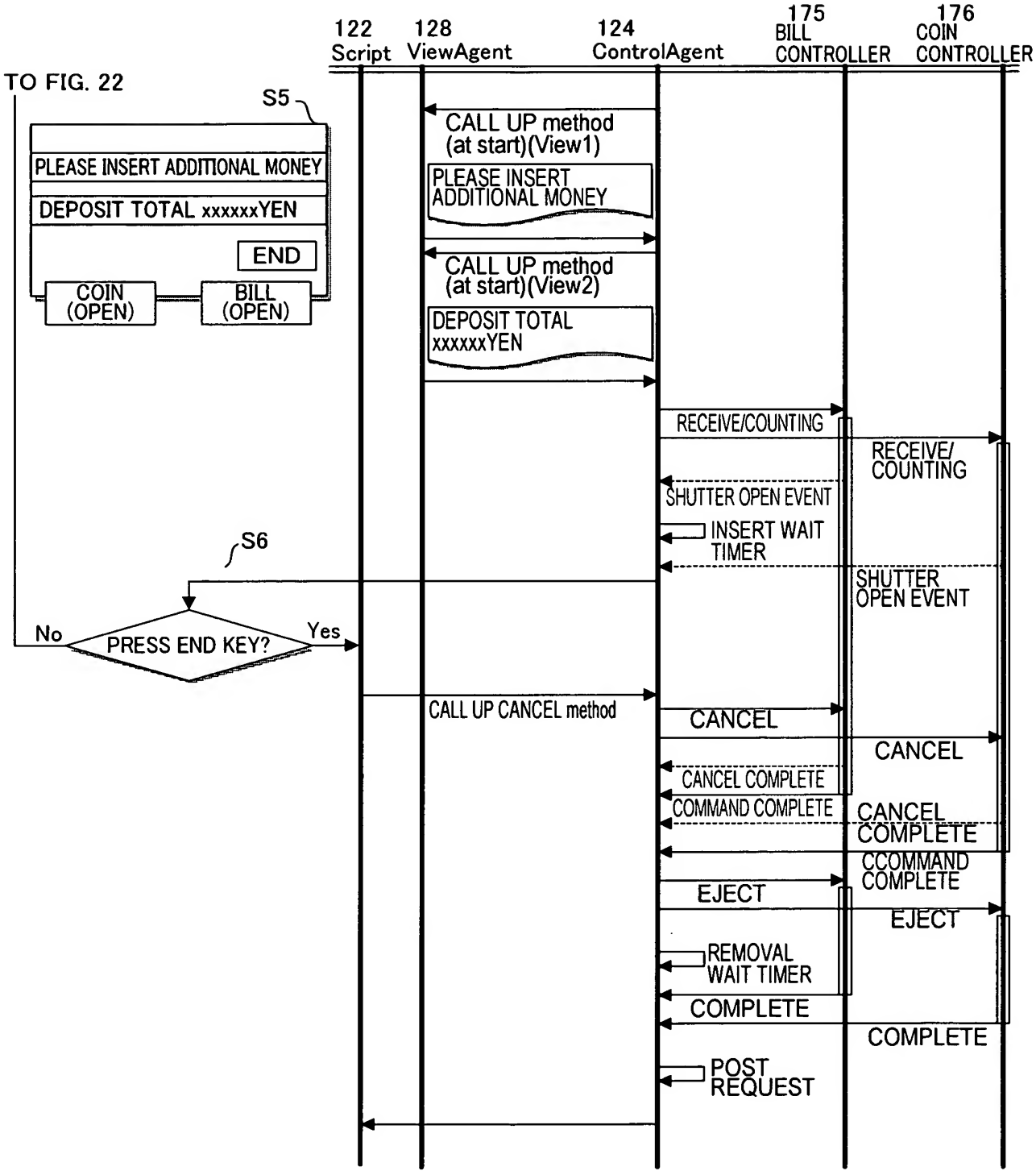

122
Script
128
ViewAgent
124
ControlAgent
175
BILL
CONTROLLER
176
COIN
CONTROLLER
TO FIG. 22
S5
PLEASE INSERT ADDITIONAL MONEY
DEPOSIT TOTAL xxxxxxYEN
END
COIN (OPEN)
BILL (OPEN)
CALL UP method (at start)(View1)
PLEASE INSERT ADDITIONAL MONEY
CALL UP method (at start)(View2)
DEPOSIT TOTAL xxxxxxYEN
RECEIVE/COUNTING
RECEIVE/ COUNTING
SHUTTER OPEN EVENT
INSERT WAIT TIMER
SHUTTER OPEN EVENT
S6
No
PRESS END KEY?
Yes
CALL UP CANCEL method
CANCEL
CANCEL
CANCEL COMPLETE
COMMAND COMPLETE
CANCEL COMPLETE
CCOMMAND COMPLETE
EJECT
EJECT
REMOVAL WAIT TIMER
COMPLETE
COMPLETE
POST REQUEST

FIG. 24

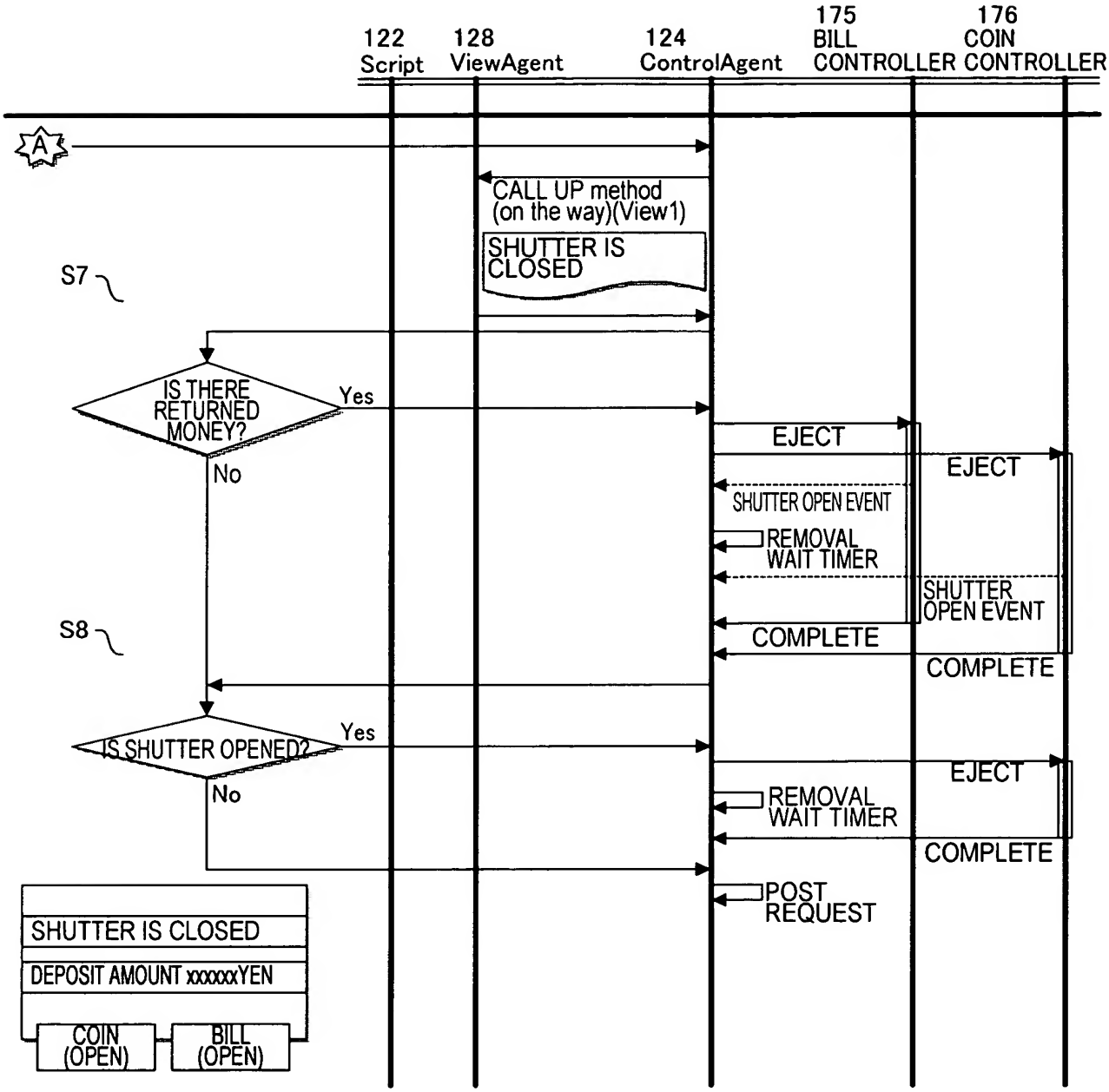

122
Script
128
ViewAgent
124
ControlAgent
175
BILL
CONTROLLER
176
COIN
CONTROLLER
A
CALL UP method
(on the way)(View1)
SHUTTER IS
CLOSED
S7
IS THERE
RETURNED
MONEY?
Yes
No
EJECT
EJECT
SHUTTER OPEN EVENT
REMOVAL
WAIT TIMER
SHUTTER
OPEN EVENT
S8
COMPLETE
COMPLETE
IS SHUTTER OPENED?
Yes
No
EJECT
REMOVAL
WAIT TIMER
COMPLETE
POST
REQUEST
SHUTTER IS CLOSED
DEPOSIT AMOUNT xxxxxxYEN
COIN
(OPEN)
BILL
(OPEN)

FIG. 25

AGENT	METHOD	IO CONTROLLER								
		NONE	BILL	COIN	PAS BOOK	CARD	RECEIPT	JOURNAL	TRANS-ACTION	TEN KEY
SYNCHRONIZATION	INITIALIZE		●	●	●	●	●	●	●	●
	MECHANISM RESET		●	●	●	●	●	●		
	BILL/COIN INSERT		●	●						
	MEDIUM SIMULTANEOUS EJECT		●	●	●	●	●			
	PRINT/FEED/MS WRITE/EJECT PREPARE		●	●	●	●	●	●		
	DEPOSIT RETURN		●	●						
	STORAGE		●	●						
	FORCE-EJECT/CAPTURE		●	●	●	●	●			
	OBTAIN UNIT INFORMATION/SET TRANSACTION STATUS/TWO-SCREEN DISPLAY		●	●	●	●	●	●	●	●
	DEPOSIT/WITHDRAWAL PREPARE		●	●						
	FORCE REPLENISH		●	●						
	JAM RESET		●	●						
	CARD/PASSBOOK INSERT				●	●				
POST	POST PROCESS	●								
	POST DATA HOLD	●								
TEXT DISPLAY	FONT SET	●								
	TEXT DISPLAY	●								
	TEXT ERASE	●								

FIG. 26

```
<HTML>
<HEAD>
<TITLE>WebATM Sample</TITLE>
</HEAD>

<BODY>

// SPECIFY AGENT WHICH IS CALLED UP IN THE SCREEN
<APPLET CODE="U_agtSync_.class" codebase = "http://webatm:8080/webatm"
        WIDTH="0" HEIGHT="0" NAME="U_agtSync" >
</APPLET>

// MAKE MAYSCRIPT DEFINITION SUCH THAT POSTAgent CALLS UP FUNCTION OF Java Script
<APPLET CODE="U_agtPost.class" codebase = "http://webatm:8080/webatm"
WIDTH="0" HEIGHT="0" NAME="U_agtPost" MAYSCRIPT>

<SCRIPT language="javascript">
<!--
                // DEFINE FUNCTION THAT IS CALLED UP FROM POSTAgent (REQUISITE)
                function postFunc(postData){ document.sys_form.ioResponse.value = postData;
                        window.document.sys_form.submit();
                }

                // CALL UP INITIAL METHOD IN SYNCHRONIZATION Agent
                ret = document.U_agtSync_.initial (inputParam, parseInt(postMode), parseInt(maxTimer));
                if (ret < 0) {
                        // ABNORMAL NOTIFY PROCESS
                        ~OMIT~
                }
// -->
</SCRIPT>
</BODY>
</HTML>
```

FIG. 27 PRIOR ART

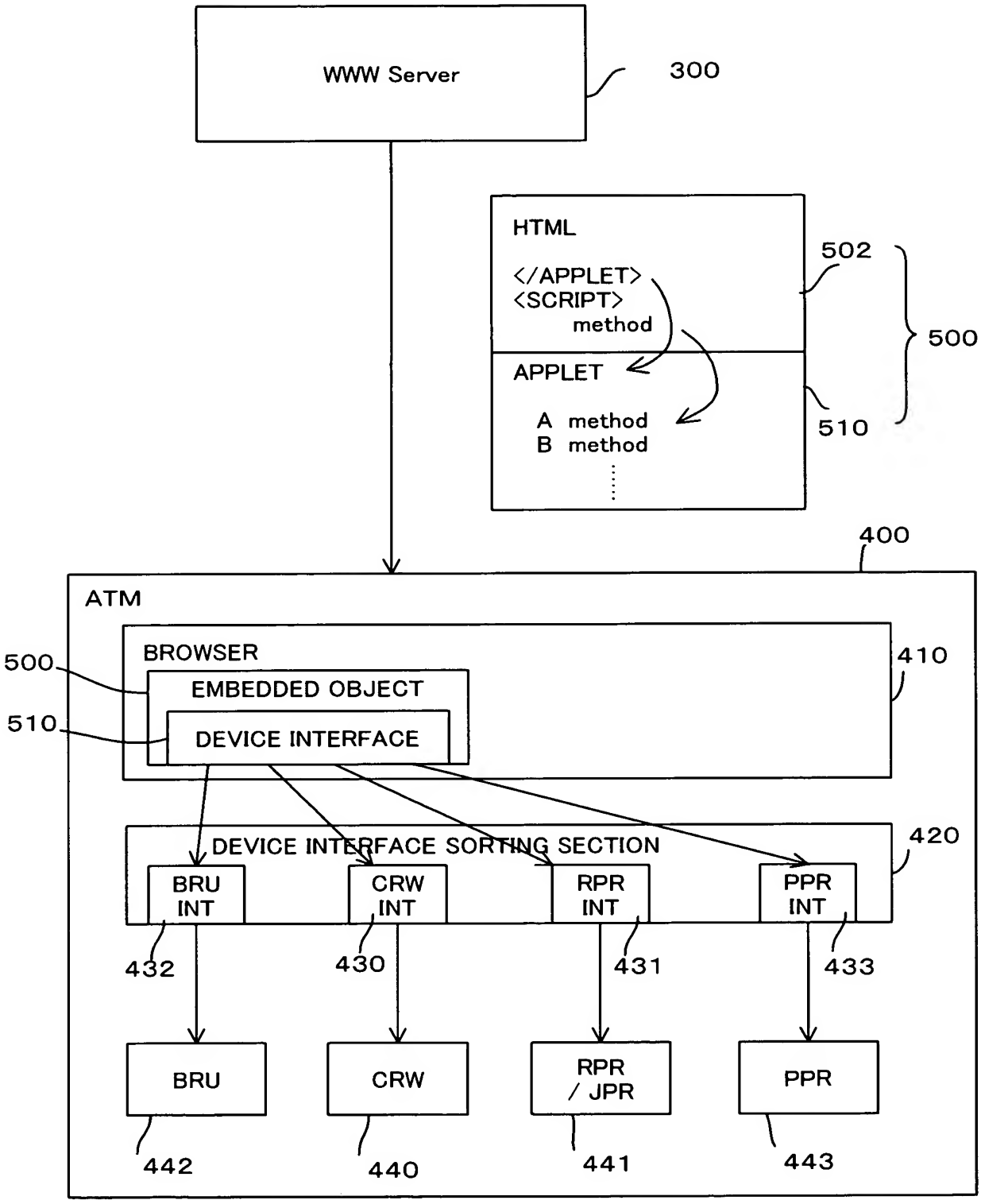
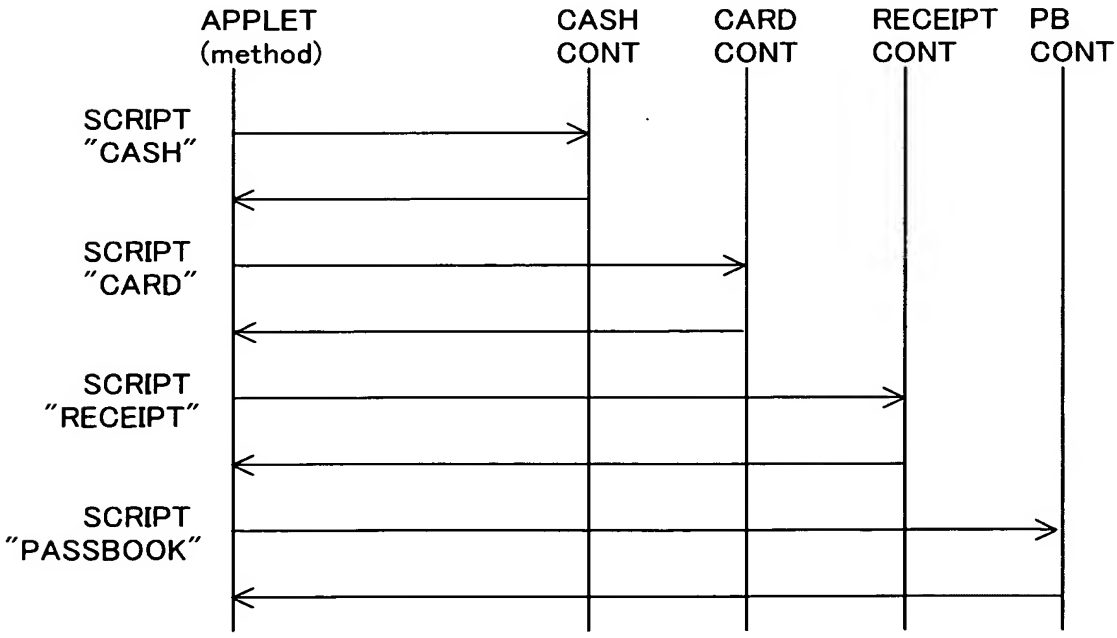


FIG. 28

PRIOR ART

```
<HTML>
(PROGRAM DISCRIPTION OF SCREEN IMAGE) OMIT
<applet code=MachineIF.class codebase=MachineIF id=IDMachinesIF>
</applet> ····· (D 1)
<script>
// INITIALIZE EACH DEVICE
FunctionInitialize{
        IDMachineIF. Initialize("Cash");
        IDMachineIF. Initialize("Card");
        IDMachineIF. Initialize("Receipt");
        IDMachineIF. Initialize("Passbook");
}
</script>
(PROGRAM DISCRIPTION OF SCREEN IMAGE) OMIT
</HTML>
```

FIG. 29

PRIOR ART